

SEG WORKSHOP

Deepwater Exploration

深水勘探研讨会



Official Program
会议手册



Hilton Shenzhen Shekou Nanhai Hotel
深圳蛇口希尔顿南海酒店

20-22 September 2015 | Shenzhen, China
2015年9月20-22日 | 中国•深圳



Welcome to SEG Deepwater Exploration Workshop

On behalf of the technical committee, we would like to welcome you to Shenzhen to attend the SEG Deepwater Exploration Workshop in September.

This workshop with the theme *Innovative Solutions for Deepwater Exploration Challenges* aims to provide an international platform for the geoscientists worldwide who work on deepwater exploration to share and discuss their research work and insights in the deepwater exploration, as well as come up with innovative solutions for the deepwater exploration challenges.

The number of abstracts submitted to the workshop greatly exceeded our expectation. We received 68 abstract submissions, and accepted 41 abstracts as oral presentations and 8 ones as poster presentations. We truly appreciate all authors' interest and effort in preparing and submitting the abstracts. We also appreciate the contributions from all the technical committee members.

Meanwhile, we are also honored and pleased to have invited the 2015 SEG South & East Asia Honorary Lecturer, Dr. Naide Pan from PGS, to deliver his lecture entitled: *Broadband marine seismic and beyond: With focus on wave-theory and multicomponent streamer-based solutions and applications*, which seamlessly matches the topics of the workshop. Moreover, we have invited six keynote speakers from the major oil & service companies to deliver presentations merely focus on the deepwater exploration.

During this two-and-half-day workshop, we have developed a rich and full technical program with one opening session, six oral sessions and one poster session to make best use of this workshop for all attendees to network and exchange ideas with each other. We have also provided a technology showcase opportunity for several companies to present their latest technologies/services related the subject of deepwater exploration to the workshop audience.

Thank you for participating and supporting SEG Deepwater Exploration Workshop. We sincerely wish you have a great experience at the workshop as well as an enjoyable stay in Shenzhen, China!

Dr. Alfred Liaw
Technical Co-Chair

Mr. Weiliang Dong
Technical Co-Chair



ORGANIZER 主办方



Society of Exploration Geophysicists
The international society of applied geophysics

SUPPORTERS 协办方



COSL

SPONSORS 赞助商

Schlumberger



**SEG Student and
Early Career**
www.seg.org/students





TECHNICAL COMMITTEE 技术委员会



Dr. Alfred Liang-Chi Liaw (Co-Chair) is currently the Executive Director of SEG China. He retired recently from Anadarko Petroleum Corporation after 38 years of industrial experience. His rich oil and gas experience covered US onshore and offshore, Alaska, West Africa, East Africa, China, Romania, Brazil, S. E. Asia, and New Zealand. In the past 15 years, his experience had primarily focused on the exploration and development projects in deepwater geologic environment. Dr. Liaw graduated from the National Taiwan University in Geology. He received a M.S. degree in Geological Sciences from SMU, and a Ph.D. from the University of California in Berkeley. Dr. Liaw served as the SEG Vice President 2010-2011, and SEG Board of Director at-large 2012-2014.



Mr. Weiliang Dong (Co-Chair) is currently the Executive Vice President of COSL. He graduated from Southwest Petroleum University with a Bachelor in petroleum geology in 1982 and has over 30 years of working experience in the oil and natural gas industry. He has been Executive Vice President and Legal Advisor of COSL from September 2011 to August 2013, and Executive Vice President and Chief Technical Officer of COSL from June 2007 to September 2011. He served as General Manager of Technology Development Department of CNOOC between July 2003 and June 2007. He subsequently held the position of CNOOC Research Center Director from May 2001 to July 2003. Between April 1999 and May 2001, he was Deputy General Manager at CNOOC China Limited – Zhanjiang Branch Company Limited. Mr. Dong had held a number of positions in China Offshore Oil Nanhai West Corporation, including Chief Geologist from September 1996 to April 1999, President of Research Institute of Exploration and Development Science from May 1994 to September 1996, Vice President of Research Institute of Exploration and Development Science from May 1993 to May 1994 and Assistant and Group Leader in Research Institute from 1982 to 1993.

Members *(listed in alphabetical order of last names)*

Fa Dwan, Shell

Lei Leu, Nexen

Xuxuan Li, CNOOC Research Institute

Dechun Lin, CGG

Yang Liu, China University of Petroleum (Beijing)

Tien-When Lo, Nexen

Nick Moldoveanu, Schlumberger

Naide Pan, PGS

Chuck Peng, Schlumberger

James Sun, CGG

Sam Sun, China University of Petroleum (Beijing)

Xiaoming Tang, China University of Petroleum (East China)

Shoujun Wang, CNOOC

Yafei Wu, Anadarko

Grace Yu, Anadarko

Jie Zhang, University of Science and Technology of China

Xianhuai Zhu, ConocoPhillips

ONSITE INSTRUCTION 参会须知

» Meeting Venue

Hilton Shenzhen Shekou Nanhai Hotel

- Add: No.1177 Wanghai Road, Nanshan District, Shenzhen, China, 518067

- Tel: +86 (0)755 21628888

**All technical sessions and activities of the workshop are held in the hotel.*

» 会议地点

深圳蛇口希尔顿南海酒店

- 地址：中国深圳市南山区望海路 1177 号，邮编：518067

- 电话：+86 (0)755 21628888

**会议期间的讲座、开幕式、技术分会场、推介会、破冰会等所有活动都该酒店内举办。*

» Onsite Registration

- Sunday, 20 September, 09:00-19:00, Lobby, China Merchants' Hall, 2/F

- Monday, 21 September, 08:00-16:00, Lobby, China Merchants' Hall, 2/F

» 现场注册 / 报到

- 9 月 20 日，周日，09:00-19:00，希尔顿二层招商堂外大厅

- 9 月 21 日，周一，09:00-16:00，希尔顿二层招商堂外大厅

» Presentation Collection

- For the keynote speakers and oral presenters, please bring your presentation to the registration area where the working staff will assist you with uploading your presentation to the computers in the session rooms for your scheduled talk at least half a day in advance;

- For the poster presenters, please prepare your posters on your own and put up your posters by 2:00 pm on 20 September. Each presenter is assigned with two poster boards. Each board has a display area of 0.9 m (width)*1.2 m (height).

» 拷贝 / 张贴报告

- 特邀报告和口头报告报告人请至少提前半天将报告拷贝给会务组工作人员。拷贝报告的地点为会议签到 / 报到处。

- 张贴报告报告人请自行准备张贴报告，并在 9 月 20 日下午 2 点前将海报贴好。每个报告人可准备两张海报，每张海报建议的尺寸为 0.9 米（宽）*1.2 米（高）。

» Shuttle buses

For attendees who stay in Fraser Place Shekou Hotel, Taizi Hotel, Ming Wah International Convention Centre and Honglux Apartment, free shuttle buses have been arranged to commute from Hilton to these hotels on 20-22 September. Please refer to the bus schedule for the detailed information.

» 穿梭巴士

9 月 20-22 日期间，为方便住在泰格国际公寓、太子宾馆、明华国际会议中心、鸿隆公寓的参会者参加会议，会务组提供了免费的穿梭巴士往返于希尔顿酒店。大巴具体发车时间和地点请参照《穿梭巴士时间表》。

» Company Technology Showcase

During 1:30 – 5:30 pm on 21 September afternoon, four companies will introduce their latest technology/products related to the deepwater exploration field. Please refer to the Company Technology Showcase flyer for the details.

» 技术推介会

9 月 21 日下午 1:30-5:30，四家国内外公司将介绍其公司在深水勘探领域中的最新的技术和产品。关于推介会详细的日程及信息请查看《推介会日程表》。

» SEG Onsite Staff 会务组联系人

- Amelie Ma 马碧云, china@seg.org, +86 18600753839(Mobile)

- Jenny Zhang 张磊贞, china@seg.org, +86 13911454323 (Mobile)

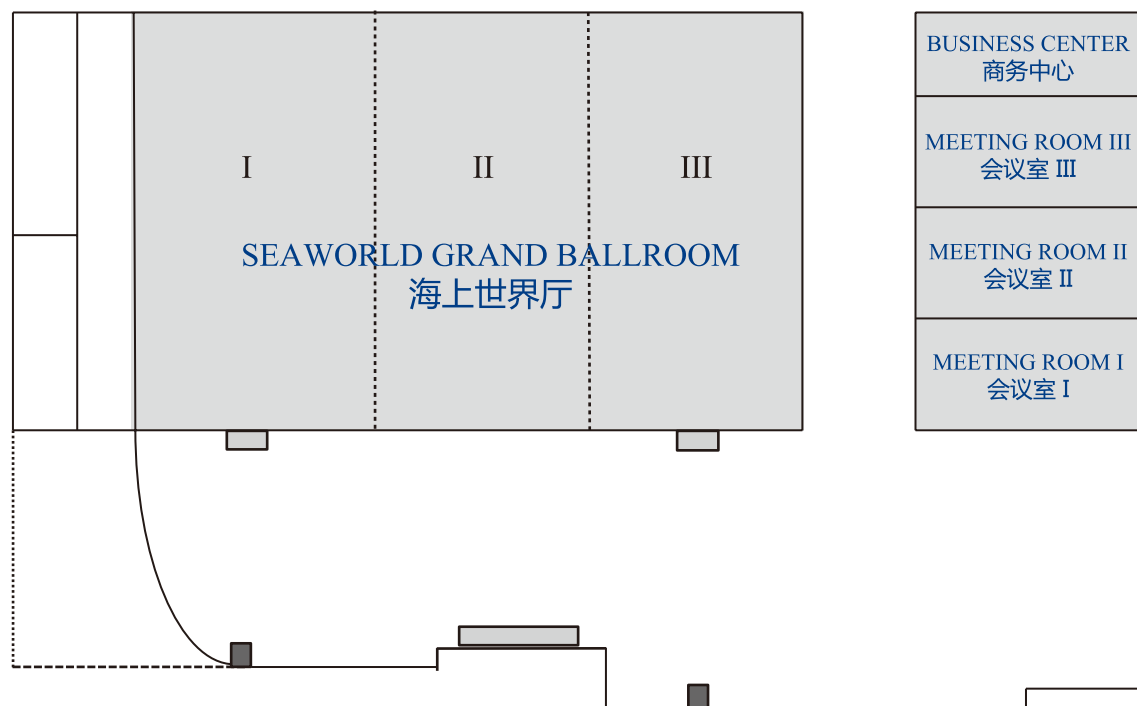
- Vicky Bai 白静, china@seg.org, +86 13718125352 (Mobile)



VENUE FLOOR PLAN 会场平面图

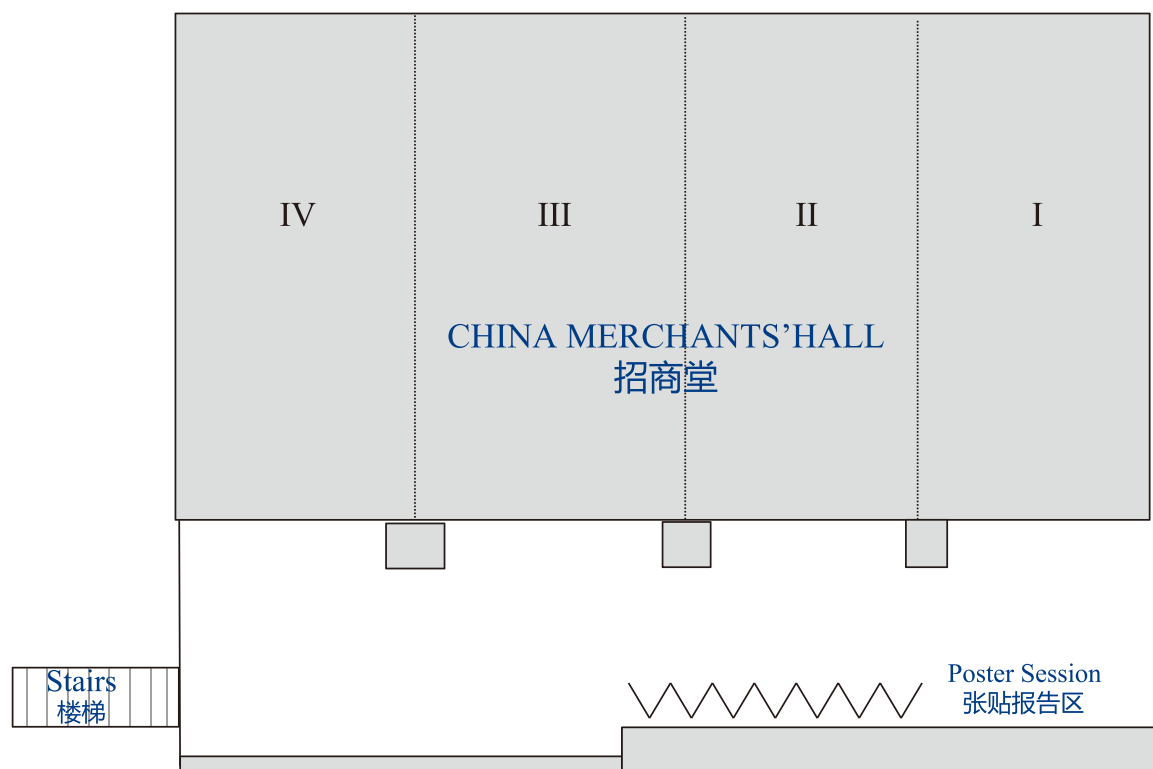
1st Floor

Hilton Shenzhen Shekou Nanhai Hotel
深圳蛇口希尔顿南海酒店



2nd Floor

Hilton Shenzhen Shekou Nanhai Hotel
深圳蛇口希尔顿南海酒店





SCHEDULE OVERVIEW 会议日程概览

Date日期	Time时间	Schedule日程安排	Location地点
20 September 9月20日	09:00-19:00	Onsite Registration 会议现场注册/报到	Lobby, China Merchants' Hall, 2/F 二层招商堂外大厅
	13:30-14:30	SEG South & East Asia Honorary Lecture SEG东南亚荣誉讲师讲座	China Merchants' Hall III+IV, 2/F 二层招商堂III+IV
	15:30-16:30	Session Chair Meeting 分会场主席会议	China Merchants' Hall III+IV, 2/F 二层招商堂III+IV
	15:00-17:00	Poster Session 张贴报告专场	Lobby, China Merchants' Hall, 2/F 二层招商堂外大厅
	17:30-19:00	Icebreaker 破冰会	China Merchants' Hall I+II, 2/F 二层招商堂I+II
21 September 9月21日	08:00-16:00	Onsite Registration 会议现场注册/报到	Lobby, China Merchants' Hall, 2/F 二层招商堂外大厅
	08:15-11:30	Opening Session & Keynote Speeches 会议开幕及特邀主题报告	China Merchants' Hall, 2/F 二层招商堂
	11:30-13:00	Buffet Lunch 午餐	Seaworld Grand Ballroom III, 1/F 一层海上世界厅III
	13:30-14:20	Poster Session (Same with the one of 20 September PM) 张贴报告专场 (与9月20日下午报告相同)	Lobby, China Merchants' Hall, 2/F 二层招商堂外大厅
	13:30-17:30	Company Technology Showcase 技术推介会	Seaworld Grand Ballroom II, 1/F 一层海上世界厅II
	14:20-17:40	Oral Session I: 口头报告专场一 : Data Acquisition Techniques to Illuminate Deepwater Exploration Targets	China Merchants' Hall I+II, 2/F 二层招商堂I+II
	14:20-17:40	Oral Session II: 口头报告专场二 : Integrate Multidisciplinary Data to Improve Deepwater Reservoir Characterization	China Merchants' Hall III+IV, 2/F 二层招商堂III+IV
	18:30-20:00	Student & Early Professional Reception 学生&青年地球物理学家招待会	Seaworld Grand Ballroom III, 1/F 一层海上世界厅III
22 September 9月22日	08:30-11:55	Oral Session III: 口头报告专场三 : Broadband Seismology to Enhance Deepwater Reservoir Resolution	China Merchants' Hall I+II, 2/F 二层招商堂I+II
	08:30-11:55	Oral Session IV: 口头报告专场四 : Advanced Processing and Imaging Technology to Better Define Deepwater Prospects	China Merchants' Hall III+IV, 2/F 二层招商堂III+IV
	12:00-13:00	Buffet Lunch 午餐	Seaworld Grand Ballroom III, 1/F 一层海上世界厅III
	13:30-17:40	Oral Session V: 口头报告专场五 : Improved Workflow and Integration to Interpret Deepwater Reservoirs	China Merchants' Hall I+II, 2/F 二层招商堂I+II
	13:30-17:40	Oral Session VI: 口头报告专场六 : Advanced Processing and Imaging Technology to Better Define Deepwater Prospects	China Merchants' Hall III+IV, 2/F 二层招商堂III+IV



MEETING SCHEDULE 会议日程

Sunday, 20 September 2015

09:00 - 19:00	Onsite Registration
13:30 - 14:30	SEG South& East Asia Honorary Lecture Broadband marine seismic and beyond: With focus on wave-theory and multicomponent streamer-based solutions and applications. <i>Naide Pan (PGS)</i> <i>Session Chair: Alfred Liaw</i>
15:30 - 16:30	Session Chair Meeting
15:00 - 17:00	Poster Session <i>Session Co-chairs: Jie Zhang & Gary Liu</i>
Poster 01	Research and application of shallow water multiples attenuation methods based on wave equations. <i>Fusheng Di, Mengchang Shi, Zhiguo Ma (Seismic Data Processing and Interpretation Center , Geo-Cosl , Tanggu)</i>
Poster 02	The analyzation of OBN data processing flow and research progress. <i>Yiran Xu, Jingye Li (National Engineering Laboratory for Offshore Oil Exploration, China University of Petroleum, Beijingn), Xiaohong Chen (State Key Laboratory of Petroleum Resource and Prospecting, China University of Petroleum, Beijing)</i>
Poster 03	Tectonic evolution and the identification of tectonic transformation zone of Heshan sag in the ultra-deep water area in the Pearl River Mouth Basin. <i>Baoqing Zhao (China University of Petroleum, Beijing)</i>
Poster 04	Direct estimation for Russell fluid factor by adaptive MCMC inversion for deep reservoir. <i>Xinpeng Pan, Guangzhi Zhang, and Changlu Sun (China University of Petroleum Huadong)</i>
Poster 05	A gas-water discriminant method based on SVM. <i>Jiale Liu*, Xiaotao Wen, Yaju Hao, Wenhua Wang (Chengdu University of Technology)</i>
Poster 06	Frequency decomposition convolutional model for AVO/AVF analysis in viscoelastic media. <i>Jingkang Yang*, Jianhua Geng, Luanxiao Zhao (Tongji University)</i>
Poster 07	Seismic impedance inversion research based on global optimization algorithm. <i>Jianjun Chen*, Zhenyu Zhu, Jinmiao Zhang (CNOOC Research Institute)</i>
Poster 08	Application of model-based interpretation method in XJ24-1 reservoir. <i>Zhipeng Liu*, Zhenyu Zhu, Jinmiao Zhang, Yang Ouyang (CNOOC Research Institute)</i>
17:30 - 19:00	Icebreaker

Monday, 21 September 2015

08:00 - 16:00	Onsite Registration	
08:15 - 11:30	Opening Session <i>Session Co-chairs: Alfred Liaw & Kai Yang</i>	
08:15 - 08:30	Safety Moment	
08:30 - 08:55	Keynote: South China Sea deepwater exploration and geophysics challenges. <i>Weilin Zhu, Chief Geologist, CNOOC</i>	
08:55 - 09:20	Keynote: Deepwater seismic exploration challenges. <i>Huimin Hao, Chief Geophysicist, BGP</i>	
09:20 - 09:55	Keynote: Application of tridimensional delayed fire air-gun array in the offshore seismic. <i>Yibiao Zhang, Deputy General Manager, Sinopec Offshore Oilfield Service Co., Shanghai Geophysical Branch</i>	
09:55 - 10:15	Coffee Break	
10:15 - 10:40	Keynote: Collaboration in deepwater exploration, does it really work? <i>Wadii Karkouri, Vice President, WesternGeco - China and Asia</i>	
10:40 - 11:05	Keynote: Unlocking the full potential of broadband data with advanced processing and imaging technology. <i>Joe Zhou, Processing Manager, CGG Signapore Scope</i>	
11:05 - 11:30	Keynote: Broadband seismic reduces risk in deep water exploration and production. <i>Guillaume Cambois, Executive Vice President, PGS</i>	
11:30 - 13:00	Lunch	
13:30 - 14:20	Poster Session <i>(same with the poster session of 20 September PM)</i>	
13:30 - 17:30	Company Technology Showcase	
14:20 - 17:40	Oral Session I Data Acquisition Techniques to Illuminate Deepwater Exploration Targets <i>Session Co-chairs: Naide Pan & Kai Yang</i>	Oral Session II Integrate Multidisciplinary Data to Improve Deepwater Reservoir Characterization <i>Session Co-chairs: Joe Mongan & Jun Liu</i>
14:20 - 14:45	Simultaneous long offset (SLO) towed streamer seismic acquisition - a case study from offshore Gabon. <i>Mazin FAROUKI*, Andrew Long, Eddy von Abendorff (Petroleum GeoServices, PGS); Michael Purves, Justin Norris (Ophir Energy); Alcindo Moritz (Petrobras)</i>	Use RGB plotting technique for improving reservoir prediction efficiency. <i>Xiudi Jiang (CNOOC Research Institute)</i>
14:45 - 15:10	Joint inversion of hydrophone data for air-gun source signature estimation. <i>Yuan Ni, Risto Siliqi (CGG Services S.A)</i>	Integration of rock physics analysis and full waveform inversion in deep water exploration. <i>Wenhui Yu*, Aifei Bian, Wei Zhu (China University of Geosciences, Wuhan); Wei Wei, (LandOcean Energy Services Co., Ltd.,); Chengzhi Yan, Lian Hu (Shenzhen Branch of CNOOC Ltd.,)</i>
15:10 - 15:35	Improving resolution of seismic tomography with stereo acquisition geometry in deep marine exploration. <i>Zhihui Zou, Jianzhong Zhang (Ocean University of China); Aifei Bian (China University of Geosciences)</i>	Pre-stack reservoir prediction for lithologic trap with a few wells in the deep strata of Baiyun deep water area. <i>Xi Xiao*, Zhihong Wang, Zhibin Liu, Yiming Zhang, Jianhua Chen (CNOOC Research Institute)</i>



Monday, 21 September 2015

15:35 - 16:00	Coffee Break	
16:00 - 16:25	The application research on marine plow cable broadband acquisition and seismic processing. <i>Chuncheng Liu*</i> , <i>Zhibin Liu</i> , <i>Jie Tao</i> , <i>Zhenhua Jiao</i> (CNOOC Research Institute)	Pre-salt carbonate characterisation in Kwanza Basin using 2D dual-sensor broadband seismic. <i>Noémie Pernin</i> , <i>Cyrille Reiser</i> , <i>Tim Bird</i> (PGS Reservoir Limited); <i>Mazin Farouki*</i> (PGS Asia Pacific Pte. Ltd.)
16:25 - 16:50	Full waveform inversion of vertical cable data for deep water target - A synthetic study. <i>Aifei Bian*</i> , <i>Wenhui Yu</i> , <i>Jianchao Cai</i> (China University of Geosciences, Wuhan); <i>Zhihui Zou</i> , <i>Jin Zhang</i> , <i>Huawei Zhou</i> (Ocean University of China)	Velocity modeling for reservoir characterization. <i>Xiaohong Hao</i> (Institute of SINOPEC Shanghai Offshore Oil & Gas Company)
16:50 - 17:15	Acquisition direction design based on delaunay triangulation. <i>Yanqing Li*</i> , <i>Ziqiu Wang</i> , <i>Jin Tang</i> , <i>Yong Deng</i> (China Oilfield Services Limited); <i>Lijun Dong</i> (Lanzhou Center for Oil and Gas Resources, Institute of Geology and Geophysics)	Time-lapse seismic interpretation in XJ Oilfield using quadrature attribute. <i>Shuyun Sang *</i> , <i>Zhenyu Zhu</i> , <i>Xiaoliu Wang</i> , <i>Jinmiao Zhang</i> (Geophysics Key Lab, Technology R&D Center, CNOOC Research Institute)
17:15 - 17:40	Panel Discussion	Panel Discussion
18:30 - 20:00	Student & Early Professional Reception (Invited Only)	

Tuesday, 22 September 2015

08:30 - 11:55	Oral Session III Broadband Seismology to Enhance Deepwater Reservoir Resolution <i>Session Co-chairs: Tien-When Lo & Li Chen</i>	Oral Session IV Advanced Processing and Imaging Technology to Better Define Deepwater Prospects <i>Session Co-chairs: Dechun Lin & Yihua Xuan</i>
08:30 - 08:55	Application of de-noise method in South China Sea, based on frequency difference. <i>Shuili Dong</i> , <i>Baocang Fan</i> , <i>Zheng Wang</i> , and <i>Chaoyin Qu</i> (China Oilfield Services Limited)	Compensating visco-acoustic effects in TTI Reverse Time Migration. <i>Yi Xie</i> , <i>James Sun</i> , <i>Yu Zhang</i> , <i>Joe Zhou</i> (CGG)
08:55 - 09:20	A deghosting method based on source wavelet processing. <i>Jie Tao*</i> , <i>Baoshu Chen</i> , <i>Songkang Li</i> , <i>Lianqun Zhang</i> , <i>Xiaochun Yang</i> , <i>Zhongfei Tong</i> , <i>Dong Xue</i> , <i>Xiaojiang Wang</i> (CNOOC Research Institute)	Rock physics guided velocity modeling for imaging and pore pressure with applications for subsalt. <i>Nader C. Dutta</i> and <i>Sherman Yang</i> (Schlumberger)
09:20 - 09:55	Broadband processing techniques for marine seismic data and its applications. <i>Baoqing Zhang*</i> , <i>Jianqing Guo</i> , <i>Zaiyu Ding</i> , <i>Ran Li</i> (BGP,CNPC); <i>Jiayu Wu</i> (Southwest Petroleum University)	Acoustic & elastic coupled equation-base ERTM for ocean bottom seismic data. <i>Pengfei Yu *</i> , <i>Jianhua Geng</i> (Tongji University)
09:55 - 10:15	Coffee Break	

Tuesday, 22 September 2015

10:15 - 10:40	Key technology application for improving mid-deep layer structure imaging of the X basin in deepwater areas of China South Sea. <i>Lianqun* Zhang, Baoshu Chen, Songkang Li, Xiaojiang Wang, Jie Tao, Wenbo Sun (CNOOC Research Institute); Yanqing Li (COSL)</i>	Pre-stack Q estimation method and its application on hydrocarbon detection in deepwater area. <i>Yaju Hao*, Xiaotao Wen, Wenhua Wang, Jiale Liu (Chengdu University of Technology); Liyang Ha (Institute of Geophysical and Geochemical Exploration CAGS)</i>
10:40 - 11:05	Apply of variable-depth streamer seismic acquisition. <i>Hongjian Li, Ligu Han*, Xiangbo Gong (Jilin University)</i>	Deghost of towed streamer data in τ -p domain based on rough sea surface reflectivity. <i>Xingyan Zhang (China University of Mining and Technology; CNOOC EnerTech-Drilling & Production Co., Development & Prospecting Geophysical Institute); Wenying Shi, Zhongyu Fang, Tiancai Li, Zhiwei Dan (CNOOC EnerTech-Drilling & Production Co., Development & Prospecting Geophysical Institute)</i>
11:05 - 11:30	The broadband mechanism analysis for marine multi-level-depth streamer. <i>Jin Tang, Kai Yang (China Oilfield Services Limited)</i>	Internal multiples attenuation based on the Local-ISS method for the deepwater exploration. <i>Xiaodong Shi*, Liu Hong, Haixin Feng (Key Laboratory of Petroleum Resources Research, Institute of Geology and Geophysics, The Chinese Academy of Sciences)</i>
11:30 - 11:55	Panel Discussion	Study on correction for tidal statics in marine time-lapse seismic. <i>Wenbo Sun*, Zhenyu Zhu, Jinmiao Zhang, Xiaoliu Wang, Lianqun Zhang (CNOOC Research Institute)</i>
12:00 - 13:00	Lunch	
13:30 - 17:40	Oral Session V Improved Workflow and Integration to Interpret Deepwater Reservoirs <i>Session Co-chairs: Jie Zhang & Ziqiu Wang</i>	Oral Session VI Advanced Processing and Imaging Technology to Better Define Deepwater Prospects <i>Session Co-chairs: Mazin Farouki & Zheng Wang</i>
13:30 - 13:55	Seismic Guided Drilling (SGD*): A new integrated approach for mitigating drilling risk in the deep water environment. <i>Jie Cui, Sherman Yang, Andy Hawthorn (Schlumberger Geosolutions China)</i>	The study of oil-water recognition based on the theory of diffusive-viscous wave equation. <i>Wenhua Wang*, Xiaotao Wen, Junhui Hu, Yaju Hao, Jiale Liu (Chengdu University of Technology)</i>
13:55 - 14:20	Petroleum geological features and exploration potential of Mexico deep-water basin. <i>Haowei Zhou*, Jingmei Lu (CNOOC Research Institute)</i>	Determining reservoir distribution using 3D seismic attributes, a case study from Semliki Basin Uganda. <i>Calorine Twebaze, Philips Obita (The Petroleum Exploration and Production Department, Uganda); John Mary Kiberu, Aanyu Kevin (Department of Geology and Petroleum Studies, Makerere University)</i>



Tuesday, 22 September 2015

14:20 - 14:45	2D multi-component seismic stacking velocity tomography for basin floor fan facies model segmentation. <i>Junwei Zhang, André Revil (Colorado School of Mines)</i>	Obtaining a seismic image above the well trajectory using the sea surface VSP multiples – A case study for deepwater exploration well. <i>The Nguyen Dac*, Michael Sanders, Tuan Nguyen Ngo Anh, Sadu-ur Rehman (Schlumberger); Michael Lawson, Foo Say Jeow, Khanh Tran Van (Talisman Energy Vietnam)</i>
14:45 - 15:10	Deepwater exploration and development un Tullow Oil: Ji-Fi a new tool for better sub-surface prediction. <i>Joe Mongan*, Adrian Pelham (Tullow Oil plc); V. Somaza (Ikona Science Ltd.)</i>	The impact of water-velocity variations on deepwater seismic data and its processing technique. <i>Dun Deng, Jianwei He (Zhanjiang Branch of CNOOC Ltd)</i>
15:10 - 15:35	Coffee Break	
15:35 - 16:00	Discuss of dual azimuth seismic processing. <i>Tao Xie, Jinming Xia (China Oilfield Services Limited Geophysical Data Processing Centre); Qifeng Wang (CNOOC International Limited)</i>	Enhanced surface related multiple attenuation methods on 2D deepwater seismic data: Seram Sea case study. <i>Tumpal Bernhard Nainggolan (Marine Geological Institute)</i>
16:00 - 16:25	Integrating well and seismic data for source rocks evaluation: A case from Indus basin. <i>Wanhui Liu*, Xufeng Zhang, Aiquan Chen, Xianfeng Peng, Youhua Shi, Kongzhi Huang (BGP, CNPC)</i>	Multiple removal on 2D offshore data with rugged ocean bottom and strong ocean current. <i>Shungen Wang, Mei Wu*, Yingchun Tian, Guisheng Xie (LandOcean Energy Services Co.)</i>
16:25 - 16:50	The strategy of hydrocarbon prediction (DHI) in deepwater exploration area. <i>Jianli Yang*, Xinwei Chang (Elsiwave Reservoir)</i>	Seismic spherical spreading and compensation in deepwater. <i>Jiaxiong Zhou*, Yu Wang, Jianwei He, Ruiming Wang (China National Offshore Oil Company, Zhanjiang Branch)</i>
16:50 - 17:15	Application of hydrocarbon detection of seismic relative attribute. <i>Mingxiong Ying*, Dianyuan Chen, Jianying Liu, Zuyin Chen, Shiyu Liu (Research Institute of CNOOC Ltd. Zhanjiang)</i>	Diffraction multiple attenuation of deepwater, Qiongdongnan Basin. <i>Mingzhu Liu*, Tiancai Li, Jinpeng Liu, Ming Zhao, Leiming Sun, Jihui Chou (CNOOC EnerTech-Drilling & Production Co., Development & Prospecting Geophysical Institute, Zhanjiang)</i>
17:15 - 17:40	Panel Discussion & Workshop Adjourns	Panel Discussion & Workshop Adjourns

SEG SOUTH & EAST ASIA HONORARY LECTURE

东南亚荣誉讲师讲座

Title: **Broadband marine seismic and beyond: With focus on wave-theory and multicomponent streamer-based solutions and applications**

Lecturer: **Dr. Naide Pan, PGS**



Naide Pan received a Ph. D. in geophysics from Allied Geophysical Laboratories (AGL) at the University of Houston in 1987. In 1987-1993, Pan was senior research geophysicist for Tensor Geophysical, and in 1994-1997, he was Vice President and Senior Vice President for PGS Data Processing. Since 1998, Pan has been President of PGS China. He received honorable mention for best oral presentation and was coauthor of a best poster presentation in early 1990's, both from SEG. He is 2015 SEG Honorary Lecturer for South and East Asia. Pan's current research interest is in building a unified theory and method for seismic

imaging and inversion with application to efficient acquisition geometries and robust processing algorithms.

Abstract

Broadband marine towed streamer seismic has become the technology of choice for exploration seismic because of the multiple benefits it offers. Current broadband technologies can be divided into three classes: (1) multicomponent streamer systems that facilitate wavefield separation; (2) acquisition methods using conventional hydrophone only streamers; (3) processing solutions that can be applied to any old or new conventional dataset. The focus of this presentation is on the multicomponent-streamer solution that uses wavefield separation.

The presentation consists of three main parts: (1) basic concepts of broadband, (2) direct and indirect benefits of broadband, and (3) beyond broadband. The first part covers broadband basics and differentiation among various technologies, including the definition, solution and classifications of broadband seismic; key assumptions and approximations behind the technologies and their impact on the outcome; de-ghosting only versus wavefield separation solutions.

In the second part, direct and explicit benefits of broadband marine seismic are summarized. These include: increased bandwidth and resolution, increased signal to noise ratio (S/N), better depth penetration, and improved operational efficiency by extending the weather window. This is followed by indirect and implicit benefits of broadband, which are focused on and illustrated by some qualitative and quantitative interpretation related data examples.

In the last part, some methods and imaging techniques are reviewed which uniquely benefit from the access to a full set of wavefields as provided by multicomponent marine towed streamer acquisition systems. These include, but are not limited to: migration of multiples using the down-going wave as a secondary source; and full-waveform inversion (FWI) by using both reflection and ultralow-frequency refraction. In all such developments, which go beyond simple broadband pursuits, the down-going wave is used as a separate useful signal, rather than incorporated as ghost noise!

Finally, some important challenges in broadband development are investigated. Among others the low frequency marine source challenge is reviewed briefly.



Society of Exploration Geophysicists

The international society of applied geophysics

国际勘探地球物理学家学会

SEG 中国

北京市朝阳区建国路 93 号院万达广场 5 号楼 2501 室 100022

电话：+86 10 5820 5048 传真：+86 10 5820 5047

网址：www.seg.org

邮箱：china@seg.org